## SUMMARY OF 2004 SEATTLE ENERGY CODE

(6 July 2005)

On 12 November 2004, the Washington State Building Code Council adopted changes to the Washington State Energy Code that took effect on 1 July 2005. Consequently, Seattle needed to update the Seattle Energy Code. The resulting 2004 Seattle Energy Code consists of the 2004 Washington State Energy Code with Seattle amendments to the nonresidential provisions. While the first comprehensive Seattle Energy Code took effect in February 1980, Seattle has had residential insulation requirements since 1974 and the first furnace sizing and duct insulation requirements took effect in 1927. Seattle has regularly updated its Energy Code to incorporate changes in technology and to improve implementation.

The goals for this Seattle Energy Code update cycle were to:

- incorporate the 2004 Washington State Energy Code changes and
- as necessary, clarify existing Seattle amendments.

The energy savings from the 2004 Seattle Energy Code update are estimated to be similar to that of the 2003 Seattle Energy Code.

For seven sections, existing Seattle amendments are modified to reflect partial adoption into the Washington State Energy Code, with an exception added for certain skylights. One clarification is included at the end regarding daylight zone controls. The majority of the existing Seattle amendments to the Washington State Energy Code are unchanged.

These changes were refined through public review and endorsed by the DPD Construction Codes Advisory Board. DPD expresses its gratitude for all of those who participated in this process. Their efforts will result in a Seattle Energy Code that is more workable for all.

#### **PUBLIC REVIEW PROCESS**

In the fall of 2004, DPD indicated that it would begin a public review of proposed amendments to the Seattle Energy Code in January 2005. Staff from DPD and Seattle City Light developed a proposal that was released on 22 December 2004. Seattle DPD announced the beginning of the public review and a review meeting in an e-mail to the Seattle Energy Code e-mail list, and in an e-mail to the CCAB e-mail list.

On 6 January 2005, DPD held a public meeting to discuss the 22 December 2004 draft of amendments for the 2004 Seattle Energy Code. As a result of that meeting, a second draft was developed with several minor changes. That draft was distributed on 6 January 2005. The deadline for written comments was 25 January 2005. Two comments were received on the second draft recommending minor revisions: one allowing a higher SHGC for plastic dome skylights provided that the visible transmittance (VT) is higher than the SHGC (Table 13-1, footnote 8), and a second regarding a minimum of two daylight control zones for overhead glazing where the daylight zone area from skylights exceeds 5,000 square feet (Section 1513.3.1). DPD incorporated those recommendations.

CCAB endorsed the DPD recommendations at their meeting on 17 February 2005.

#### **CODE LANGUAGE PROPOSALS**

The disposition of all of the existing Seattle amendments is shown below, followed by a section-by-section comparison of the changes in the eight sections cited above.

## <u>Carry-over of Existing Seattle Amendments – Partial Adoption into 2004 Washington State</u> <u>Energy Code</u>

The Seattle amendments to the following sections and tables are existing amendments that are modified solely because they were adopted in part into the 2004 Washington State Energy Code:

1132.3	Alterations and Repairs, Lighting and Motors.
1322	Opaque Envelope.
1331	Component Performance, General.
Table 13-1	Building Envelope Requirements. (Note that a new footnote 8 has been added in response to public comment.)
1423	Simple Systems, Economizers.
1433	Complex Systems, Economizers.
Table 15-1	Unit Lighting Power Allowance.

#### Seattle Amendments Adopted into the 2004 Washington State Energy Code

The previous Seattle amendments to the following sections have now been adopted into the 2004 Washington State Energy Code and so no Seattle amendments are proposed:

Table 10-6	Other than Group R Occupancy: Default U-Factors for Vertical Glazing, Overhead Glazing and Opaque Doors.
1413.3	Economizers, Integrated Operation.
Table 14-1A	Unitary Air Conditioners and Condensing Units.
Table 14-1B	Unitary and Applied Heat Pumps.
Table 14-1D	Packaged Terminal Air Conditioners, Packaged Terminal Heat Pumps, Room Air Conditioners, and Room Air Conditioner Heat Pumps.
1513.6	Automatic Shut-off Controls, Interior.
1521	Prescriptive Interior Lighting Requirements.

#### Existing Seattle Amendments to be Retained – Clarification

The existing Seattle amendment to the following section is proposed to be retained with a clarification:

1513.3 Daylight Zone Control.

## Existing Seattle Amendments to be Retained – No Changes

The existing Seattle amendments to the following sections and tables are proposed to be retained with no changes:

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701	Standards
Table 10-5A	Default U-Factors for Metal Stud Walls (Other than Group R Occupancy).
Table 10-5B	Default U-Factors for Concrete and Masonry Walls (Other than Group R Occ.)
1132.2	Alterations and Repairs, Building Mechanical Systems.
1133	Change of Occupancy or Use.
1144	Violations and Penalties.
1150	Conflicts with Other Codes.
1161	Severability.
1162	Liability.
1301	Building Envelope, Scope.
1310	Building Envelope, General Requirements (Conditioned & Semi Heated Space).
1311.6	Radiant Floors.
1312.2	Solar Heat Gain Coefficient and Shading Coefficient.
1323	Glazing.
1333	UA Calculations.
1402	Mechanical Ventilation.
1411	HVAC Equipment Performance Requirements.
1412	Controls.
1413.1	Economizers, Operation.
1413.5	Economizer Heating System Impact.
1414	Ducting Systems.
1416	Commissioning.
1421	System Type.
1431.2	System Sizing Limits.
1432.2	Systems Temperature Reset Controls, Hydronic Systems.
1435	Simultaneous Heating and Cooling.
1436	Heat Recovery.
1437	Electric Motor Efficiency.
1438	Variable Flow Systems and System Criteria.
1440	Service Water Heating.
1452	Pool Water Heaters.
Table 14-1C	Water Chilling Packages.
Tables 14-1K	
1501	Scope.
1510	General.
1512	Exempt Lighting.
1513.1	Local Control and Accessibility.
1513.5	Automatic Shut-off Controls, Exterior.
1530	Lighting Power Allowance Option.
1532	Exterior Lighting Power Allowance.
1540	Transformers.
RS-29, Sec. 3	.4 HVAC Systems and Equipment.
Sec. 3.6.5	Parking Garage Ventilation.
Table 3-3	HVAC Systems of Prototype Buildings.

#### **SECTION-BY-SECTION SUMMARY**

For Section 1132.3, Section 1322, Section 1331, Table 13-1, Section 1423, Section 1433, and Table 15-1, the text below shows first, the existing Seattle Energy Code requirements, and then, the proposed incorporation of the existing Seattle amendments into the new 2004 Washington State Energy Code base language.

#### **CHAPTER 11**

#### (1) 1132.3 Lighting and Motors

### Existing 2003 Seattle Energy Code Language:

**1132.3 Lighting and Motors:** Where the use in a space changes from one use in Table 15-1 to another use in Table 15-1, the installed lighting wattage shall comply with Section 1521 or 1531.

Other tenant improvements, alterations or repairs where 60 percent or more of the fixtures in a space enclosed by walls or ceiling-height partitions are new shall comply with Sections 1531 and 1532. (Where this threshold is triggered, the areas of the affected spaces may be aggregated for code compliance calculations.)

Where less than 60 percent of the fixtures in a space enclosed by walls or ceiling-height partitions are new, the installed lighting wattage shall be maintained or reduced. Where 60 percent or more of the lighting fixtures in a suspended ceiling are new, and the existing insulation is on the suspended ceiling, the roof/ceiling assembly shall be insulated according to the provisions of Chapter 13, Section 1311.2.

Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, (except as noted in the following paragraph), controls shall comply with Sections 1513.1 through 1513.5 and 1513.7. For compliance with Section 1513.3.2 for existing luminaires where the existing ballasts are not being changed, the number of required incremental steps of automatic daylighting control shall be equal to one plus the number of ballasts in the luminaire. In addition, office areas less than 300 ft<sup>2</sup> enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, shall be equipped with occupancy sensors that comply with Section 1513.6. Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with the other requirements in Section 1513.6.

Where new walls or ceiling height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have controls that comply with Sections 1513.1 through 1513.2 and 1513.4 through 1513.7

Those motors which are altered or replaced shall comply with Section 1511.

# <u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington State Energy Code Base Language:</u>

**1132.3 Lighting and Motors:** Where the use in a space changes from one use in Table 15-1 to another use in Table 15-1, the installed lighting wattage shall comply with Section 1521 or 1531.

Other tenant improvements, alterations or repairs where 60% or more of the fixtures in a space enclosed by walls or ceiling-height partitions (((as defined in Table 15-1) within a tenant space or in an entire floor-)) are new shall comply with Sections 1531 and 1532. (Where this threshold is triggered, the areas of the affected spaces may be aggregated for code compliance calculations.)

Where less than 60% of the fixtures in a space enclosed by walls or ceiling-height partitions are new, the installed lighting wattage shall be maintained or reduced. Where 60% or more of the lighting fixtures in a suspended ceiling are new, and the existing insulation is on the

suspended ceiling, the roof/ceiling assembly shall be insulated according to the provisions of Chapter 13, Section 1311.2.

Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit (except as noted in the following paragraph), controls shall comply with Sections 1513.1 through 1513.5 and, as applicable, 1513.7. For compliance with Section 1513.3.2 for existing luminaires where the existing ballasts are not being changed, the number of required incremental steps of automatic daylighting control shall be equal to one plus the number of ballasts in the luminaire. In addition, office areas less than 300 ft<sup>2</sup> enclosed by walls or ceiling-height partitions, and all meeting and conference rooms, and all school classrooms, shall be equipped with occupancy sensors that comply with Section 1513.6 and 1513.7. Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with the other requirements in Sections 1513.6 and 1513.7.

Where new walls or ceiling height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have controls that comply with Sections 1513.1 through 1513.2, 1513.4, and 1513.6 through 1513.7.

Those motors which are altered or replaced shall comply with Section 1511.

#### **CHAPTER 13**

## (2) 1322 Opaque Envelope

#### Existing 2003 Seattle Energy Code Language:

**1322 Opaque Envelope:** Roof/ceilings, opaque exterior walls, opaque doors, floors over unconditioned space, below-grade walls, slab-on-grade floors and radiant floors enclosing conditioned spaces shall be insulated according to Section 1311 and Tables 13-1 or 13-2. Compliance with nominal R-values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only. Nominal R-values shall not include the thermal transmittance of other building materials or air films.

For metal frame assemblies used in spaces with electric resistance space heat, compliance shall be demonstrated with the component U-factor for the overall assembly based on the assemblies in Chapter 10.

Area-weighted averaging of the R-value is not allowed. When showing compliance with R-values, the minimum insulation R-value for all areas of the component shall comply with Table 13-1. When calculating compliance using U-factors, area-weighted averaging is allowed. Where insulation is tapered (e.g. roofs), separate assembly U-factors shall be calculated for each four-foot section of tapered insulation.

**EXCEPTIONS:** 1. Opaque smoke vents are not required to meet insulation requirements.

- 2. For prescriptive compliance only,
- a. for glazing areas that are 30% and less of the gross wall area, the insulation of the perimeter edge of an above grade floor slab which penetrates the exterior wall may be reduced to R-5 provided that the glazing U-factor is reduced by U-0.05 below that required in Tables 13-1 and 13-2.
- b. for glazing areas that exceed 30% of the gross wall area, the perimeter edge of an above grade floor slab which penetrates the exterior wall may be left uninsulated provided that the glazing U-factor is reduced by U-0.10 below that required in Tables 13-1 and 13-2.
- 3. For roofs with continuous rigid insulation on the top of the roof, the insulation R-value may be averaged for compliance with minimum prescriptive R-values only, provided that both:
  - a. the minimum insulation is no less than R-5 (but not including area within 6 inches of each roof drain), and
  - b. the area-weighted average insulation is R-46 (in lieu of R-30) for electric resistance space heat and R-27 (in lieu of R-21) for other fuels.

## <u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington State Energy Code Base Language:</u>

**1322 Opaque Envelope:** Roof/ceilings, opaque exterior walls, opaque doors, floors over unconditioned space, below grade walls, slab on grade floors, and radiant floors enclosing conditioned spaces shall be insulated according to Section 1311 and Tables 13-1or 13-2. Compliance with nominal R-values shall be demonstrated for the thermal resistance of the added insulation in framing cavities and/or insulated sheathing only. Nominal R-values shall not include the thermal transmittance of other building materials or air films.

For metal frame assemblies used in spaces with electric resistance space heat, compliance shall be demonstrated with the component U-factor for the overall assembly based on the assemblies in Chapter 10.

Area-weighted averaging of the R-value is not allowed. When showing compliance with R-values, the minimum insulation R-value for all areas of the component shall comply with Table 13-1. When calculating compliance using U-factors, area-weighted averaging is allowed. Where insulation is tapered (e.g. roofs), separate assembly U-factors shall be calculated for each four-foot section of tapered insulation.

#### **EXCEPTIONS:**

- 1. Opaque smoke vents are not required to meet insulation requirements.
- 2. For prescriptive compliance only,

- a. for glazing areas that are 30% and less of the gross wall area, the insulation of the perimeter edge of an above grade floor slab which penetrates the exterior wall may be reduced to R-5 provided the glazing U-factor is reduced by U-0.05 below that required in Tables 13-1 and 13-2.
- b. for glazing areas that exceed 30% of the gross wall area, the perimeter edge of an above grade floor slab which penetrates the exterior wall may be left uninsulated provided that the glazing Ufactor is reduced by U-0.10 below that required in Tables 13-1 and 13-2.
- 3. For roofs with continuous rigid insulation on the top of the roof, the insulation R-value may be averaged for compliance with minimum prescriptive R-values only, provided that both:
  - a. the minimum insulation is no less than R-5 (but not including area within 6 inches of each roof drain), and
  - b. the area-weighted average insulation is R-46 (in lieu of R-30) for electric resistance space heat and R-27 (in lieu of R-21) for other fuels.

### (3) 1331 General

#### Existing 2003 Seattle Energy Code Language:

1331 General: Buildings or structures whose design heat loss rate  $(UA_p)$  and solar heat gain coefficient rate  $(SHGC * A_p)$  are less than or equal to the target heat loss rate  $(UA_t)$  and solar heat gain coefficient rate  $(SHGC * A_t)$  shall be considered in compliance with this section. The stated U-factor, F-factor or allowable area of any component assembly, listed in Tables 13-1 or 13-2, such as roof/ceiling, opaque wall, opaque door, glazing, floor over conditioned space, slab-on-grade floor, radiant floor or opaque floor may be increased and the U-factor or F-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors, F-factors or allowable areas specified in this section.

#### **EXCEPTION:**

- 1. Compliance is also allowed to be shown using RS-32.
- 2. The prescriptive approach in Section 1323 may be used for that portion of the building envelope that complies with Exception 1 to Section 1323.

## <u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington</u> State Energy Code Base Language:

1331 General: Buildings or structures whose design heat loss rate  $(UA_p)$  and solar heat gain coefficient rate  $(SHGC*A_p)$  are less than or equal to the target heat loss rate  $(UA_t)$  and solar heat gain coefficient rate  $(SHGC*A_t)$  shall be considered in compliance with this section. The stated U-factor, F-factor or allowable area of any component assembly, listed in Tables 13-1 or 13-2, such as roof/ceiling, opaque wall, opaque door, glazing, floor over conditioned space, slab on grade floor, radiant floor or opaque floor may be increased and the U-factor or F-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors, F-factors or allowable areas specified in this section.

#### **EXCEPTIONS:**

- 1. Compliance is also allowed to be shown using RS-32.
- 2. The prescriptive approach in Section 1323 may be used for that portion of the building envelope that complies with Exception 1 to Section 1323.

#### (4) TABLE 13-1

## Existing 2003 Seattle Energy Code Language:

### TABLE 13-1 BUILDING ENVELOPE REQUIREMENTS FOR CLIMATE ZONE 1

#### Minimum Insulation R-Values or Maximum Component U-Factors for Zone 1

**Building Components** 

Chass Heat Type	Compo	Components								
Space Heat Type	Roofs Over Attic <sup>3</sup>	All Other Roofs <sup>3</sup>	Opaque Walls <sup>1,2</sup>	Opaque Doors	Floor Over Uncond Space	Slab-On- Grade <sup>5</sup>				
1. Electric resistance heat**		R-30 or U=0.034	R-19 or U=0.062	U=0.60	R-30 or U=0.029	R-10 or F=0.54				
All others including heat pumps and VAV	R-30 or U=0.036	R-21 or U=0.050	<ul> <li>(a) Metal framing: R-13 cavity insul. + R-3.8 continuous insul. or U-0.084;</li> <li>(b) Wood framing &amp; framing other than metal: R-19 or U-0.062</li> </ul>		R-19 or U=0.056	R-10 or F=0.54				

<sup>\*\*</sup> Compliance with nominal prescriptive R-values requires wood framing

### Maximum Glazing Areas and U-Factors and Maximum Glazing Solar Heat Gain Coefficients for Zone 1

Glazing

Space Heat Type	Maximum Glazing Area as % of Wall								
	(	)% to 20	0%	>20% to 30%		30%	>30% to 45%		45%
		mum actor	Max. SHGC <sup>4</sup>		mum actor	Max. SHGC <sup>4</sup>	Maxi U-Fa		Max. SHGC <sup>4</sup>
	VG	OG		VG	OG		VG	OG	
1. Electric resistance heat <sup>7</sup>	0.40	0.48	0.40	0.40	0.48	0.30	PR	ESCRIP	TIVE
				Pre	scriptive	only,		PATE	I
					C	t UA or analysis	NO'	T ALLC	OWED
2. All others including heat pumps and VAV <sup>6</sup>	0.55	0.66	0.40	0.55	0.66	0.40	0.45	0.54	0.40

#### **Footnotes**

#### 1. Below Grade Walls:

When complying by the prescriptive approach, Section 1322:

- a) walls insulated on the interior shall use opaque wall values,
- b) walls insulated on the exterior shall use a minimum of R-10 insulation,
- c) walls shall be insulated for the first 10 feet below grade. (There shall be no credit for insulating those portions of below grade walls and footings that are more than 10 feet below grade, and those portions below 10 feel shall not be included in the gross exterior wall area.)

When complying by the component performance approach, Section 1331:

- a) walls insulated on the interior shall use the opaque wall values when determining  $U_{\text{bgwt}}$ ,
- b) walls insulated on the exterior shall use a target U-factor of U=0.070 for  $U_{\text{bgwt}}$ ,
- c) the calculations shall include the first 10 feet of walls below grade. (Those portions of below grade walls and footings that are more than 10 feet below grade shall not be included in the gross exterior wall area and shall not be included when determining  $A_{bgwt}$  and  $A_{bgw}$ .)

- Concrete Masonry Walls: If the area weighted heat capacity of the total opaque above grade wall is a minimum of 9.0 Btu/ft<sup>2</sup> °F, then the U-factor may be increased to
  - a) 0.11 for interior insulation
    - i) minimum R-11 insulation between wood studs; or
    - ii) minimum R-19 insulation between metal studs; or
    - iii) minimum R-10 insulation held in place solely by 1 inch metal clips at 24 inches on center vertically and 16 inches on center horizontally; and
  - b) 0.12 for integral and exterior insulation for insulation position as defined in Chapter 2.
    - i) minimum additional R-7 continuous insulation uninterrupted by framing.

Individual walls with heat capacities less than 9.0  $Btu/ft^2 \cdot {}^\circ F$  and below grade walls shall meet opaque wall requirements listed above.

Glazing shall comply with the glazing requirements listed above.

- **3. Roof Types:** A roof over attic is where the roof structure has at least 30 inches clear distance from the top of the bottom chord of a truss or ceiling joist to the underside of the sheathing at the roof ridge, and the ceiling is attached to the ceiling joist or the bottom of the truss or ceiling joist. Anything else is considered all other roofs.
- **4. SHGC** (**Solar Heat Gain Coefficient per Section 1312.2**): May substitute Maximum Shading Coefficient (SC) for SHGC (See Chapter 2 for definition of Shading Coefficient).
- 5. Radiant Floors: Where insulation is required under the entire slab, radiant floors shall use a minimum of R-10 insulation or F=0.55 maximum. Where insulation is not required under the entire slab, radiant floors shall use R-10 perimeter insulation according to Section 1311.6 or F=0.78 maximum.
- **6. Prescriptive Alternate** (not applicable to Target UA or annual energy analysis): For the prescriptive building envelope option only, for other than electric resistance heat only, glazing may comply with the following:

Maximum Glazing Area as % of Wall:	Maxim	um U-Factor	Max.
	VG	OG	SHGC <sup>4</sup>
>45% to 50%	0.40	0.48	0.35

- 7. Prescriptive Alternate for Electric Resistance Space Heat (not applicable to Target UA or annual energy analysis): For glazed wall systems, assemblies with all of the following features are deemed to satisfy the vertical glazing U-factor requirement of U-0.40 and the overhead glazing U-factor or U-0.48:
  - a. Double glazing with a minimum 1/2 inch gap width, having a low-emissivity coating with e=0.10 maximum, with 90% minimum argon gas fill, and a non-aluminum spacer (as defined in footnote 1 to Table 10-6B), and
  - b. Frame that is thermal break aluminum (as defined in footnote 7 to Table 10-6A), wood, aluminum clad wood, vinyl, aluminum clad vinyl, or reinforced vinyl.

<u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington State Energy Code Base Language:</u>

## TABLE 13-1 BUILDING ENVELOPE REQUIREMENTS FOR CLIMATE ZONE 1

### MINIMUM INSULATION R-VALUES OR MAXIMUM COMPONENT U-FACTORS FOR ZONE 1

**Building Components** 

Sp	ace Heat		Components							
	Type	Roofs Over Attic <sup>3</sup>	All Other Roofs <sup>3</sup>	Opaque Walls 1,2	Opaque Doors	Floor Over Uncond Space	Slab On Grade <sup>5</sup>			
1.	Electric	R-38 or	R-30 or	R-19 or	U=0.60	R-30 or	R-10 or			
	resistance	U=0.031	U=0.034	U=0.062		U=0.029	F=0.54			
	heat**									
2.	All others	R-30 or	R-21 or	(a) Metal framing:	U=0.60	R-19 or	R-10 or			
	including	U=0.036	U=0.046	(( <del>R-19 or U-0.109</del> ))		U=0.056	F=0.54			
	heat pumps			R-13 cavity insul. + R-3.8 continuous insul.						
	and VAV			<u>or U=0.084;</u>						
				(b) Wood framing & framing other than metal:						
				R-19 or U=0.062						

<sup>\*\*</sup> Compliance with nominal prescriptive R-values requires wood framing.

## MAXIMUM GLAZING AREAS AND U-FACTORS AND MAXIMUM GLAZING SOLAR HEAT GAIN COEFFICIENTS FOR ZONE 1

Glazing

zing						
Maximum Glazing Area as % of Wall	0% to 30%		>30% to 45%			
		aximum -Factor	Max. SHGC <sup>4</sup> .8	Maximum U-Factor Max. SHO		Max. SHGC <sup>4</sup> .8
	VG	OG		VG	OG	
1. Electric resistance heat	0.40	(( <del>0.60</del> )) <u>0.48</u>	0.40	PRESCRIPTIVE PATH NOT ALLOWED		
2. All others including	0.55	((0.70))	(( <del>0.45</del> ))	0.45	(( <del>0.60</del> ))	0.40
heat pumps and VAV		0.66	<u>0.40</u>		0.54	

#### **Footnotes**

#### 1. Below Grade Walls:

When complying by the prescriptive approach, Section 1322:

- a) Walls insulated on the interior shall use opaque wall values,
- b) Walls insulated on the exterior shall use a minimum of R-10 insulation,
- c) Walls shall be insulated for the first 10 feet below grade. (There shall be no credit for those portions of below grade walls and footings that are more than 10 feet below grade, and those portions below 10 feet shall not be included in the gross exterior wall area.)

When complying by the component performance approach, Section 1331:

- a) Walls insulated on the interior shall use the opaque wall values when determining U<sub>bgwt</sub>,
- b) Walls insulated on the exterior shall use a target U-factor of U=0.070 for U<sub>bgwt</sub>,
- c) The calculations shall include the first 10 feet of walls below grade. (Those portions of below grade walls and footings that are more than 10 feet below grade shall not be included in the gross exterior wall area and shall not be included when determining  $A_{\text{bgwt}}$  and  $A_{\text{bgw}}$ .)

- 2. Concrete Masonry Walls: If the area weighted heat capacity of the total opaque above grade wall is a minimum of 9.0 Btu/ft<sup>2</sup> °F, then:
  - a. The area weighted average U-factor may be increased to ((0.15 maximum or minimum additional R-5.7 continuous insulation uninterrupted by framing)) 0.11 maximum for interior insulation:
    - i) minimum R-11 insulation between wood studs; or
    - ii) minimum R-19 insulation between metal studs; or
    - iii) minimum R-10 insulation held in place solely by 1 inch metal clips at 24 inches on center vertically and 16 inches on center horizontally; or
  - b. 0.12 for integral and exterior insulation for insulation position as defined in Chapter 2.
    - i) minimum additional R-7 continuous insulation uninterrupted by framing.

((The wall may be ASTM C90 concrete block walls, ungrouted or partially grouted at 32 in. or less on center vertically and 48 in. on center or less horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 44 Btu/ft - oF.))

Individual walls with heat capacities less than 9.0 Btu/ft<sup>2</sup> • °F and below grade walls shall meet opaque wall requirements listed above. Glazing shall comply with the glazing requirements listed above.

- **3. Roof Types:** A roof over attic is where the roof structure has at least 30 inches clear distance from the top of the bottom chord of a truss or ceiling joist to the underside of the sheathing at the roof ridge, and the ceiling is attached to the ceiling joist or the bottom of the truss or ceiling joist. Anything else is considered all other roofs.
- **4. SHGC** (**Solar Heat Gain Coefficient per Section 1312.2**): May substitute Maximum Shading Coefficient (SC) for SHGC (See Chapter 2 for definition of Shading Coefficient).
- **5. Radiant Floors:** Where insulation is required under the entire slab, radiant floors shall use a minimum of R-10 insulation or F=0.55 maximum. Where insulation is not required under the entire slab, radiant floors shall use R-10 perimeter insulation according to Section 1311.6 or F=0.78 maximum.
- 6. Prescriptive Alternate (not applicable to Target UA or annual energy analysis): For the prescriptive building envelope option only, for other than electric resistance heat only, glazing may comply with the following:

7. Prescriptive Alternate for Electric Resistance Space Heat (not applicable to Target UA or annual energy analysis):

For glazed wall systems, assemblies with all of the following features are deemed to satisfy the vertical glazing U-factor requirement of U-0.40 and the overhead glazing U-factor of U-0.48:

- a) Double glazing with a minimum 1/2 inch gap width, having a low-emissivity coating with e=0.10 maximum, with 90% minimum argon gas fill, and a non-aluminum spacer (as defined in footnote 1 to Table 10-6B), and
- b) Frame that is thermal break aluminum (as defined in footnote 7 to Table 10-6A), wood, aluminum clad wood, vinyl, aluminum clad vinyl, or reinforced vinyl.
- 8. Daylighting with Plastic Skylights. For plastic skylights, the SHGC is allowed to be SHGC-0.65 maximum provided that:
  - a) the visible transmittance (VT) is greater than the SHGC and
  - b) the skylight area is no greater than 6% of the overhead daylight zone.

#### **CHAPTER 14**

#### (5) 1423 Economizers

#### Existing 2003 Seattle Energy Code Language:

**1423 Economizers:** Economizers meeting the requirements of Section 1413 shall be installed on single package unitary fan-cooling units having a total cooling capacity greater than 20,000 Btu/h including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear.

The total capacity of all units without economizers (i.e. these units with a total cooling capacity of 20,000 Btu/h and less) shall not exceed 240,000 Btu/h per building, or 10% of its aggregate cooling (economizer) capacity, whichever is greater. That portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building.

# <u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington State Energy Code Base Language:</u>

- **1423 Economizers:** Economizers meeting the requirements of Section 1413 shall be installed on:
- ((a.)) Cooling units ((installed outdoors or in a mechanical room adjacent to the outdoors)) having a total cooling capacity greater than 20,000 Btu/h including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear((; and
- Other cooling units with a total cooling capacity greater than 54,000 Btu/h including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear.)).

The total capacity of all units without economizers (i.e., those units with a total cooling capacity less than 20,000 Btuh((a. and b. above))) shall not exceed 240,000 Btu/h per building, or 10% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building.

#### (6) 1433 Economizers

#### Existing 2003 Seattle Energy Code Language:

**1433 Economizers:** Air economizers meeting the requirements of Section 1413 shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear.

#### **EXCEPTIONS:** 1. Small units:

- Cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h.
- b. Other cooling units and split systems with a total cooling capacity less than 54,000 Btu/h.

The total cooling capacity of all such systems in 1.a and 1.b without economizers shall not exceed 240,000 Btu/h per building, or 10% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building. Redundant units are not counted in the capacity limitations.

- 2. Systems complying with all of the following criteria:
  - a. Consist of multiple water-source heat pumps with a total cooling capacity for each water-source heat pump of less than 54,000 Btu/h that are connected to a common water loop having a central boiler or furnace providing heat to the loop and having a central cooling tower providing cooling to the loop.
  - b. Have a minimum of 50% air economizer complying with Section 1413 that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that they are physically fastened so that the outside air duct is directed into the unit intake.
  - c. Have water-source heat pumps with a capacity-weighted average cooling system efficiency that is a minimum of 10% greater than the requirements in Tables 14-1A and 14-1B (1.10 x values in Tables 14-1A and 14-1B).
  - d. Have a central boiler or furnace efficiency that is a minimum of 8% higher than the value in Table 14-1F (1.08 x value in Table 14-1F), and
  - e. Provide heat recovery with a minimum 50% heat recovery effectiveness as defined in Section 1436 to preheat the outside air supply.

This exception shall not be used for RS-29 analysis.

- 3. Systems for which at least 75% of the annual energy used for mechanical cooling is provided from site-recovery or site-solar energy source.
- Systems where special outside air filtration and treatment, for the reduction and treatment of unusual outdoor contaminants, makes an air economizer infeasible.
- Systems that affect other systems (such as dehumidification and supermarket refrigeration systems) so as to increase the overall building energy consumption. New humidification equipment shall comply with Section 1413 4
- 6. Equipment used to cool any dedicated server room, electronic equipment room, or telecom switch room provided that they completely comply with option a or option b or option c or option d:
  - a. For a system where all of the cooling equipment is subject to the ARI standards listed in table 14-1A and Table 14-1B, the system shall comply with all of the following (note that is the system contains any cooling equipment that exceeds the capacity limits in table 14-1A or Table 14-1B, or if the system contains any cooling equipment that is not included in Table 14-1A or Table 14-1B, then the system is not allowed to use this option):
    - 1. The cooling equipment shall have an EER value and an IPLV value that is a minimum of 15% greater than the value listed in Table 14-1A and Table 14-1B (1.15 x values in Tables 14-1A and 14-1B).
    - 2. For units with a total cooling capacity over 85,000 Btuh, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50% of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g. minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
  - b. For a system where all of cooling equipment is subject to the ARI standards listed in Table 14-1A and Table 14-1B, the system shall comply with all of the following (note that if the system contains any cooling equipment that exceeds the capacity limits in Table 14-1A or Table 14-1B, or if the system contains any cooling equipment that is not included in Table 14-1A or Table 14-1B, then system is not allowed to use this option):

- 1. The cooling equipment shall have an EER value and an IPLV value that is a minimum of 5% greater than the value listed in Table 14-1A and Table 14-1B (1.05 x values in Tables 14-1A and 14-1B).
- 2. For units with a total cooling capacity over 85,000 Btuh, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50% of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g. minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
- 3. The system shall include a water economizer in lieu of air economizer. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 45°F dry-bulb/40°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures.
- c. For a system with chillers subject to the ARI standards listed in Table 14-1K, Table 14-1L, and Table 14-1M (e.g. a chilled water system with fan coil units), the system shall comply with all of the following:
  - 1. For air-cooled chillers, the cooling equipment shall have an IPLV value that is a minimum of 5% greater than the IPLV value listed in Table 14-1C (1.05 x values in Table 14-1C). For water-cooled chillers, the cooling equipment shall have an NPLV value that is a minimum of 10% greater than the NPLV value listed in Table 14-1K, Table 14-1L, and Table 14-1M (1.10 x values in Table 14-1K, Table 14-1L, and Table 14-1M).
  - 2. The chiller shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50% of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g. minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
  - 3. The system shall include a water economizer in lieu of air economizer. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 45°F dry-bulb/40°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures.
- d. For a system where all of cooling equipment is subject to ASHRAE Standard 127-2001, the system shall comply with all of the following:
  - The cooling equipment subject to the ASHRAE Standard 127-2001 shall have an EER value and an IPLV value that is equal or greater than the value listed in Table 14-1A and Table 14-1B when determined in accordance with the rating conditions ASHRAE Standard 127-2001 (i.e. not the rating conditions in ARI Standard 210/240 or 340/360).
  - 2. For units with a total cooling capacity over 85,000 Btuh, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50% of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g. minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
  - 3. The system shall include a water economizer in lieu of air economizer. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 45°F dry-bulb/40°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures.

This exception shall not be used for RS-29 analysis.

Note: For hydronic systems over 300,000 Btuh, see Section 1432.2.2.

# <u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington State Energy Code Base Language:</u>

**1433 Economizers:** Air economizers meeting the requirements of Section 1413 shall be provided on all new systems including those serving computer server rooms, electronic equipment, radio equipment, telephone switchgear.

- EXCEPTIONS: 1. Qualifying small systems: This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors. This exception is allowed to be used for other cooling units and split systems with a total cooling capacity of less than 54,000 Btu/h (hereafter referred to as qualifying small systems) provided that these are high-efficiency cooling units with EER values more than 10% higher than minimum efficiencies listed in Tables 14-1A, 14-1B and 14-1D, in the appropriate size category, using the same test procedures. The total capacity of all qualifying small systems without economizers shall not exceed 480,000 Btu/h per building, or 20% of its air economizer capacity, whichever is greater. That portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building. Redundant units are not counted in the capacity limitations. This exception shall not be used for RS-29 analysis((, nor include unitary cooling equipment installed outdoors nor in a mechanical room adjacent to the outdoors)).
  - 2. ((Water cooled refrigeration equipment provided with a water economizer meeting the requirements of Section 1413. Water economizer capacity per building shall not exceed 500 tons. This exception shall not be used for RS 29 analysis.)) Reserved.
  - 3. Systems for which at least 75% of the annual energy used for mechanical cooling is provided from site-recovery or site-solar energy source.
  - 4. Systems where special outside air filtration and treatment, for the reduction and treatment of unusual outdoor contaminants, makes an air economizer infeasible.
  - 5. Systems that affect other systems (such as dehumidification and supermarket refrigeration systems) so as to increase the overall building energy consumption. New humidification equipment shall comply with Section 1413.4.
  - 6. Systems complying with all of the following criteria:
    - a. Consist of multiple water-source heat pumps with a total cooling capacity for each water-source heat pump of less than 54,000 Btu/h that are connected to a common water loop;
    - b. Have a minimum of 60% air economizer complying with Section 1413 that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake;
    - c. Have water-source heat pumps with an EER at least 15% higher for cooling and, for units serving perimeter zones with heating loads (e.g. zones with exterior walls, roofs, or floors), a COP at least 15% higher for heating than that specified in Section 1411;
    - d. Where provided with a dedicated boiler or furnace for that building, have a central boiler or furnace efficiency of
      - i. 90% minimum for units up to 199,000 Btu/h; and
      - ii. 85% minimum for units above 199,000 Btu/h input; and
    - e. Provide heat recovery with a minimum 50% heat recovery effectiveness as defined in Section 1436 to preheat the outside air supply.
  - 7. For Group R Occupancy, cooling units installed outdoors or in a mechanical room adjacent to outdoors with a total cooling capacity less than 20,000 Btu/h and other cooling units with a total cooling capacity less than 54,000 Btu/h.

8. Equipment used to cool any dedicated server room, electronic equipment room or telecom switch room provided that they completely comply with option a or option b or option c or option d in the table below. This exception shall not be used for RS-29 analysis.

	Equipment Type	Higher Equipment Efficiency	Part-load Control	Economizer
Option a	Table 14-1A and Table 14-1B <sup>a</sup>	+ 15% <sup>b</sup>	Required over 85,000 Btu/h <sup>c</sup>	None required
Option b	Table 14-1A and Table 14-1B <sup>a</sup>	± 5% <sup>d</sup>	Required over 85,000 Btu/h <sup>c</sup>	Waterside economizer <sup>e</sup>
Option c	Table 14-1K, Table 14-1L, and Table 14-1M <sup>f</sup>	+ 5%/10% <sup>g</sup>	Required for all chillers <sup>h</sup>	Waterside economizer <sup>e</sup>
Option d	ASHRAE Standard 127 <sup>i</sup>	+ 0% <sup>j</sup>	Required over 85,000 Btu/h <sup>c</sup>	Waterside economizer <sup>e</sup>

#### Notes to Exception 8.

- a. For a system where all of cooling equipment is subject to the ARI standards listed in Table 14-1A and Table 14-1B, the system shall comply with all of the following (note that if the system contains any cooling equipment that exceeds the capacity limits in Table 14-1A or Table 14-1B, or if the system contains any cooling equipment that is not included in Table 14-1A or Table 14-1B, then system is not allowed to use this option).
- b. The cooling equipment shall have an EER value and an IPLV value that is a minimum of 15% greater than the value listed in Table 14-1A and Table 14-1B (1.15 x values in Tables 14-1A and 14-1B).
- c. For units with a total cooling capacity over 85,000 Btuh, the system shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50% of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g. minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).
- d. The cooling equipment shall have an EER value and an IPLV value that is a minimum of 5% greater than the value listed in Table 14-1A and Table 14-1B (1.05 x values in Tables 14-1A and 14-1B).
- e. The system shall include a water economizer in lieu of air economizer. Water economizers shall be capable of providing the total concurrent cooling load served by the connected terminal equipment lacking airside economizer, at outside air temperatures of 45°F dry-bulb/40°F wet-bulb and below. For this calculation, all factors including solar and internal load shall be the same as those used for peak load calculations, except for the outside temperatures.
- f. For a system with chillers subject to the ARI standards listed in Table 14-1K, Table 14-1L, and Table 14-1M (e.g. a chilled water system with fan coil units).
- g. For air-cooled chillers, the cooling equipment shall have an IPLV value that is a minimum of 5% greater than the IPLV value listed in Table 14-1C (1.05 x values in Table 14-1C). For water-cooled chillers, the cooling equipment shall have an NPLV value that is a minimum of 10% greater than the NPLV value listed in Table 14-1K, Table 14-1L, and Table 14-1M (1.10 x values in Table 14-1K, Table 14-1L, and Table 14-1M).
- h. The chiller shall utilize part-load capacity control schemes that are able to modulate to a part-load capacity of 50% of the load or less that results in the compressor operating at the same or higher EER at part loads than at full load (e.g. minimum of two-stages of compressor unloading such as cylinder unloading, two-stage scrolls, dual tandem scrolls, but hot gas bypass is not credited as a compressor unloading system).

- i. For a system where all of cooling equipment is subject to ASHRAE Standard 127-2001.
- j. The cooling equipment subject to the ASHRAE Standard 127-2001 shall have an EER value and an IPLV value that is equal or greater than the value listed in Table 14-1A and Table 14-1B when determined in accordance with the rating conditions ASHRAE Standard 127-2001 (i.e. not the rating conditions in ARI Standard 210/240 or 340/360).

Note: For hydronic systems over 300,000 Btuh, see Section 1432.2.2.

## **CHAPTER 15**

## (7) TABLE 15-1

## Existing 2003 Seattle Energy Code Language:

# TABLE 15-1 Unit Lighting Power Allowance (LPA)

Use <sup>1</sup>	$LPA^2$ (W/ft <sup>2</sup> )
Painting, welding, carpentry, machine shops	2.30
Barber shops, beauty shops	2.00
Hotel banquet/conference/exhibition hall <sup>3,4</sup>	2.00
Laboratories (see also office and other appropriate categories)	1.80
Aircraft repair hangars	1.50
Cafeterias, fast food establishments <sup>5</sup>	1.50
Factories, workshops, handling areas	1.50
Gas stations, auto repair shops <sup>6</sup>	1.50
Institutions	1.50
Libraries <sup>5</sup>	1.50
Nursing homes and hotel/motel guest rooms	1.50
Retail <sup>10</sup> , retail banking	1.50
Wholesale stores (pallet rack shelving)	1.50
Mall concourses	1.40
School buildings (Group E occupancy only, school classrooms, day care centers	1.20
Laundries	1.20
Medical office, clinics <sup>12</sup>	1.20
Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches) <sup>5,7,11</sup>	1.00
Police and fire stations <sup>8</sup>	1.00
Atria (atriums)	1.00
Assembly spaces <sup>9</sup> , auditoriums, gymnasia <sup>9</sup> , theaters	1.00
Group R-1 and R-2 common areas	1.00
Process plants	1.00
Restaurants/bars <sup>5</sup>	1.00
Locker and/or shower facilities	0.80
Warehouses <sup>11</sup> , storage areas	0.50
Aircraft storage hangars	0.40
Parking garages	See Section 1532
Plans Submitted for Common Areas Only <sup>7</sup>	

Main floor building lobbies <sup>3</sup> (except mall concourses)	1.20
Common areas, corridors, toilet facilities and washrooms, elevator lobbies	0.80

#### Footnotes for Table 15-1

- 1. In cases in which a general use and a specific use are listed, the specific use shall apply. In cases in which a use is not mentioned specifically, the *Unit Lighting Power Allowance* shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
- 2. The watts per square foot may be increased, by 2% per foot of ceiling height above 20 feet, unless specifically directed otherwise by subsequent footnotes.
- 3. The watts per square foot of room may be increased by 2% per foot of ceiling height above 12 feet.
- 4. For all other spaces, such as seating and common areas, use the *Unit Lighting Power Allowance* for assembly.
- 5. The watts per square foot of room may be increased by 2% per foot of ceiling height above 9 feet.
- 6. See Section 1532 for exterior lighting.
- 7. For conference rooms and offices less than 150 square feet with full-height partitions, a Unit Lighting Power Allowance of 1.20 W/ft² may be used.
- 8. For the fire engine room, the *Unit Lighting Power Allowance* is 1.00 W/ft<sup>2</sup>.
- 9. For indoor sport tournament courts with adjacent spectator seating, the *Unit Lighting Power Allowance* for the court area is 2.60 W/ft<sup>2</sup>, provided that there is a manual dimmer or at least two additional steps of lighting control in addition to off.
- 10. Display window illumination installed within 2 feet of the window, provided that the lighting is fitted with LED, tungsten halogen, fluorescent or high intensity discharge lamps and that the display window is separated from the retail space by walls or at least three-quarter-height partitions (transparent or opaque), and lighting for free-standing display where the lighting moves with the display are exempt.

An additional 1.5 W/ft<sup>2</sup> of merchandise display luminaires are exempt provided that they comply with all three of the following:

- a. located on ceiling-mounted track or directly on or recessed into the ceiling itself (not on the wall),
- b. adjustable in both the horizontal and vertical axes fluorescent and other fixtures with two points of track attachment are acceptable for vertical axis only),
- c. fitted with LED, tungsten halogen, fluorescent or high intensity discharge lamps.

This additional lighting power is allowed only if the lighting is actually installed.

- 11. Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior *Unit Lighting Power Allowance*, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.
- 12. Medical and clinical offices include those facilities which, although not providing overnight patient care, do provide medical, dental, or psychological examination and treatment. These spaces include, but are not limited to, laboratories and treatment centers.

# <u>Proposed Language to Incorporate Existing Seattle Amendment into new 2004 Washington State Energy Code Base Language:</u>

## TABLE 15-1 UNIT LIGHTING POWER ALLOWANCE (LPA)

Use <sup>1</sup>	LPA <sup>2</sup> (W/ft <sup>2</sup> )
Painting, welding, carpentry, machine shops	2.30
Barber shops, beauty shops	2.00
Hotel banquet/conference/exhibition hall <sup>3,4</sup>	2.00
Laboratories (see also office and other appropriate categories)	1.80
Aircraft repair hangars	1.50
Cafeterias, fast food establishments <sup>5</sup>	1.50
Factories, workshops, handling areas	1.50
Gas stations, auto repair shops <sup>6</sup>	1.50
Institutions	1.50
Libraries <sup>5</sup>	1.50
Nursing homes and hotel/motel guest rooms	1.50
Retail <sup>10</sup> , retail banking	1.50
Wholesale stores (pallet rack shelving)	1.50
Mall concourses	1.40
School buildings (Group E occupancy only, school classrooms, day care centers	(( <del>1.35</del> )) <u>1.20</u>
Laundries	1.20
Medical office, clinics <sup>12</sup>	1.20
Office buildings, office/administrative areas in facilities of other use types (including but not limited to schools, hospitals, institutions, museums, banks, churches) <sup>5,7,11</sup>	1.00
Police and fire stations <sup>8</sup>	1.00
Atria (atriums)	1.00
Assembly spaces <sup>9</sup> , auditoriums, gymnasia <sup>9</sup> , theaters	1.00
Group R-1 and R-2 common areas	1.00
Process plants	1.00
Restaurants/bars <sup>5</sup>	1.00
Locker and/or shower facilities	0.80
Warehouses <sup>11</sup> , storage areas	0.50
Aircraft storage hangars	0.40
Parking garages	See Section 1532
Plans Submitted for Common Areas Only <sup>7</sup>	
Main floor building lobbies <sup>3</sup> (except mall concourses)	1.20

Common areas, corridors, toilet facilities and washrooms,	0.80
elevator lobbies	

#### Footnotes for Table 15-1

- 1. In cases in which a general use and a specific use are listed, the specific use shall apply. In cases in which a use is not mentioned specifically, the *Unit Power Allowance* shall be determined by the building official. This determination shall be based upon the most comparable use specified in the table. See Section 1512 for exempt areas.
- 2. The watts per square foot may be increased, by 2% per foot of ceiling height above 20 feet, unless specifically directed otherwise by subsequent footnotes.
- 3. The watts per square foot of room may be increased by 2% per foot of ceiling height above 12 feet.
- 4. For all other spaces, such as seating and common areas, use the *Unit Lighting Power Allowance* for assembly.
- 5. The watts per square foot of room may be increased by 2% per foot of ceiling height above 9 feet.
- 6. See Section 1532 for exterior lighting.
- 7. For conference rooms and offices less than 150 square feet with full-height partitions, a Unit Lighting Power Allowance of 1.2 W/ft<sup>2</sup> may be used.
- 8. For the fire engine room, the *Unit Lighting Power Allowance* is 1.00 W/ft<sup>2</sup>.
- 9. For indoor sport tournament courts with adjacent spectator seating, the *Unit Lighting Power Allowance* for the court area is 2.60 W/ft<sup>2</sup> provided that there is a manual dimmer or at least two additional steps of lighting control in addition to off.
- 10. Display window illumination installed within 2 feet of the window provided that the lighting is fitted with LED, tungsten halogen, fluorescent or high intensity discharge lamps and that the display window is separated from the retail space by walls or at least three-quarter-height partitions (transparent or opaque), and lighting for free-standing display where the lighting moves with the display are exempt.

An additional 1.5 W/ft<sup>2</sup> of merchandise display luminaires are exempt provided that they comply with all three of the following:

- a. located on ceiling-mounted track or directly on or recessed into the ceiling itself (not on the wall),
- b. adjustable in both the horizontal and vertical axes (((vertical axis only is acceptable for ))fluorescent and other fixtures with two points of track attachment are acceptable with vertical axis only).
- c. fitted with LED, tungsten halogen, fluorescent, or high intensity discharge lamps.

This additional lighting power is allowed only if the lighting is actually installed.

- 11. Provided that a floor plan, indicating rack location and height, is submitted, the square footage for a warehouse may be defined, for computing the interior *Unit Lighting Power Allowance*, as the floor area not covered by racks plus the vertical face area (access side only) of the racks. The height allowance defined in footnote 2 applies only to the floor area not covered by racks.
- 12. Medical and clinical offices include those facilities which, although not providing overnight patient care, do provide medical, dental, or psychological examination and treatment. These spaces include, but are not limited to, laboratories and treatment centers.

#### (8) **SECTION 1513.3.1**

### Existing 2003 Seattle Energy Code Language (clarification shown with underline):

#### 1513.3 Daylight Zone Control

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**1513.3.1 Separate Control:** Daylight zones shall have controls which control the lights independent of general area lighting.

Contiguous daylight zones adjacent to vertical glazing are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e. north, east, south, west). Daylight zones under overhead glazing more than 15 feet from the perimeter shall be controlled separately from daylight zones adjacent to vertical glazing. For daylight zones under overhead glazing that exceed 5,000 square feet, there must be at least two independent photocontrol systems with each system having a dedicated photosensor.

**EXCEPTION:** Daylight spaces enclosed by walls or ceiling height partitions and containing 2 or fewer light fixtures are not required to have a separate switch for general area lighting.